CLAIMS

1. Process for the combustion treatment of carbonaceous particles collected on a filter situated in an exhaust circuit of an internal combustion engine, characterized in that the combustion of the said particles is brought about by contacting them with a gas mixture comprising at least nitrogen dioxide generated within the exhaust circuit of the said engine, the said particles having been seeded prior to their combustion with at least one catalyst of their oxidation.

2. Process according to claim 1, ~~characterized in that~~ Wherein the catalyst for oxidizing ~~the~~ said particles comprises at least one element selected from transition metals, alkali metals ~~and~~ alkaline earth metals, ~~such as manganese, iron, copper, sodium, nickel and scandium~~, and the rare earth metals.

3. Process according to ~~either of~~ claims 1 ~~and 2~~, ~~characterized in that~~ wherein the catalyst for oxidizing the said particles is a compound containing at least one rare earth.

4. Process according to claim 3, ~~characterized in that~~ wherein the rare earth is selected from cerium, yttrium, neodymium, gadolinium, praseodymium, lanthanum and mixtures thereof.

5. Process according to claim 3 or 4, ~~characterized in that~~ wherein the compound ~~containing~~ comprising at least one rare earth comprises cerium in a mixture with at least one other element selected from zirconium, alkali metals, alkaline earth metals and transition elements, ~~such as the elements of groups IB, VIIA and VIII of the Periodic Table, especially copper, manganese and iron~~.

6. Process according to ~~one of~~ claims 2 ~~to 5, characterized in that~~ wherein the element(s) are present in the catalyst independently of one another in the form of their respective oxide or otherwise.

7. Process according to ~~one of~~ claims 1 ~~to 6~~, ~~characterized in that~~ wherein the oxidation catalyst seeded at the level of the carbonaceous particles is incorporated therein via the introduction into the fuel of one of its derivatives such as a salt, sol or organic complex.

8. Process according to ~~one of~~ claims 1 ~~to 6~~, wherein ~~characterized in that~~ the oxidation catalyst is seeded at the level of the carbonaceous particles via its introduction alternatively into the air at the intake of the engine, or into the exhaust gas recirculation (EGR) circuit, or at the exhaust itself upstream of the particle filter.

9. Process according to ~~one of~~ claims 1 ~~to 8~~, wherein ~~characterized in that~~ the amount of oxidation catalyst seeded at the level of the carbonaceous particles is between 0.1% and 30%, preferably between 0.1% and 15%, expressed by weight of the catalytic element relative to the weight of the carbonaceous particle.

10. Process according to claim 9, wherein ~~characterized in that~~ the amount of oxidation catalyst is at least 0.5% ~~and, preferably, at least 2%~~ expressed by weight of the catalytic element relative to the weight of the carbonaceous particle.

11. Process according to ~~one of~~ claims 1 ~~to 10~~, wherein ~~characterized in that~~ the concentration of nitrogen dioxide required for the combustion of ~~the~~ said carbonaceous particles is adjusted by a change in the control of the engine, performed continuously or discontinuously so as to induce the burning of the carbonaceous particles collected on the filter.

12. Process according to ~~one of~~ claims 1 ~~to 10~~, wherein ~~characterized in that~~ the concentration of nitrogen dioxide required for the combustion of the said carbonaceous particles is generated catalytically.

13. Process according to ~~one of~~ claims 1 ~~to 10 and 12~~, wherein ~~characterized in that~~ the nitrogen dioxide is generated by catalytic conversion of nitrogen monoxide.

14. Process according to claim 13, wherein ~~characterized in that~~ the conversion of the nitrogen monoxide to nitrogen dioxide is performed in a step prior to the oxidation of the carbonaceous particles.

15. Process according to claim 14, wherein ~~characterized in that~~ the conversion of the nitrogen monoxide to nitrogen dioxide is performed upstream of the filter containing the carbonaceous particles to be oxidized.

16. Process according to claim 14 ~~or 15~~, wherein ~~characterized in that~~ the conversion of the nitrogen monoxide to nitrogen dioxide is performed by contacting the exhaust gas with a

conversion catalyst, CC, for converting the nitrog n monoxide to nitrogen dioxide, which is present on a support which is situated upstream of the filter containing the carbonaceous particles to be oxidized and through which the said exhaust gas passes.

17. Process according to ~~one of~~ claim~~s~~ 1 ~~to 10 and 12 and 13,~~ ~~characterized in that~~ Wherein the conversion of the nitrogen monoxide to nitrogen dioxide is performed concommitantly with the oxidation of the carbonaceous particles by the nitrogen dioxide thus formed.

18. Process according to claim 17, ~~characterized in that~~ Wherein the catalytic conversion of the nitrogen monoxide to nitrogen dioxide is carried out at the level of the filter on which the carbonaceous particles to be oxidized are collected.

19. Process according to claim 18, ~~characterized in that~~ Wherein the catalyst permitting the conversion of the nitrogen monoxide to nitrogen dioxide is present at the level of the filter containing the carbonaceous particles to be oxidized.

20. Process according to ~~one of~~ claim~~s~~ 10 ~~and 12 to 19,~~ ~~characterized in that~~ Wherein the catalyst for converting the nitrogen monoxide to nitrogen dioxide is selected from those based on platinum, palladium, ruthenium, rhodium and their mixtures ~~such as metal oxides of the platinum group, for instance rhodium oxide, Rh_2O_3 or the like as well~~ and as simple oxides or mixed oxides ~~such as transition metal oxides such as those based on cerium and/or manganese, such as CeO_2, Mn_2O_3, Mn_2O_3-CeO_2, Mn_2O_3-CeO_2-ZrO_2 and the perovskite systems~~.

21. Process according to claim 20, ~~characterized in that~~ Wherein the catalyst is deposited on a support of the alumina, titanium, silica or zeolite type in a pure or doped form.

22. Process according to claim 21, ~~characterized in that~~ Wherein the catalyst for converting the nitrogen monoxide to nitrogen dioxide is based on platinum deposited on a lanthanum-doped titanium oxide.

23. Process according to ~~one of~~ claim~~s~~ 12 ~~to 22,~~ ~~characterized in that~~ Wherein the catalyst for converting the nitrogen monoxide to nitrogen dioxide is combined with a so-called NO_x trap system.

24. Process according to claim 23, ~~characterized in that~~ Wherein the system is a composition comprising a support based on an oxide of c rium, an oxide of zirconium and an

oxide of scandium or of a rare earth other than cerium and an active phase based on manganese and on at least one other element, selected from the group consisting of alkali metals, alkaline earth metals and rare earth metals or a composition comprising a supported phase containing manganese and at least one other element selected from the group consisting of terbium, gadolinium, europium, samarium, neodymium and praseodymium and a support based on cerium oxide or a mixture of cerium oxide and zirconium oxide.

25. Process according to ~~one of~~ claim~~s~~ 1 ~~to 10 and 12 to 22,~~ wherein ~~characterized in that~~ the nitrogen dioxide is generated by passing the exhaust gases through a support on which is deposited at least one catalyst for converting the nitrogen monoxide to nitrogen dioxide so as to generate nitrogen dioxide which is subsequently transported by the exhaust gases to a metal filter comprising the carbonaceous particles to be oxidized, which filter is located downstream of the support and at a distance sufficient for the nitrogen dioxide coming into contact with ~~the~~ said carbonaceous particles to be present in an amount sufficient to ensure their effective oxidation.